

# ASTEP

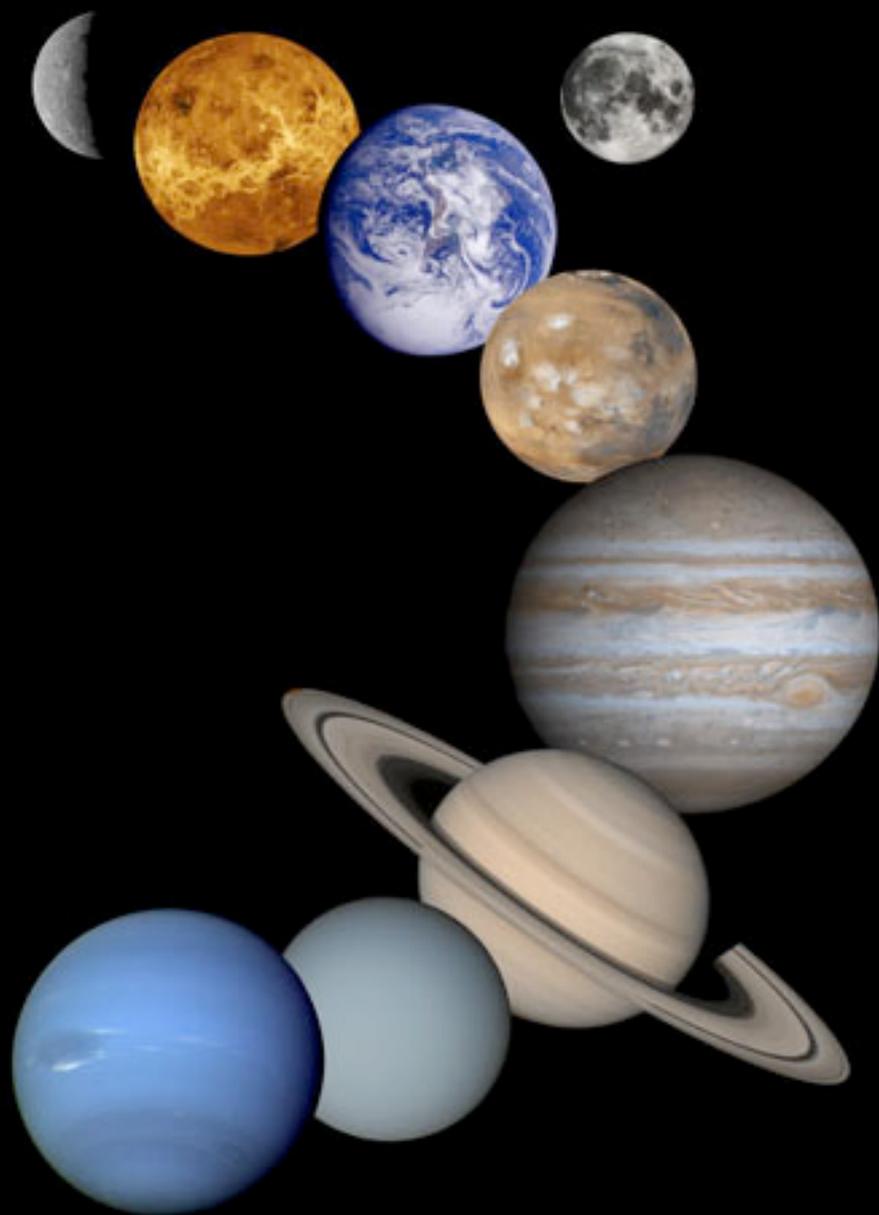


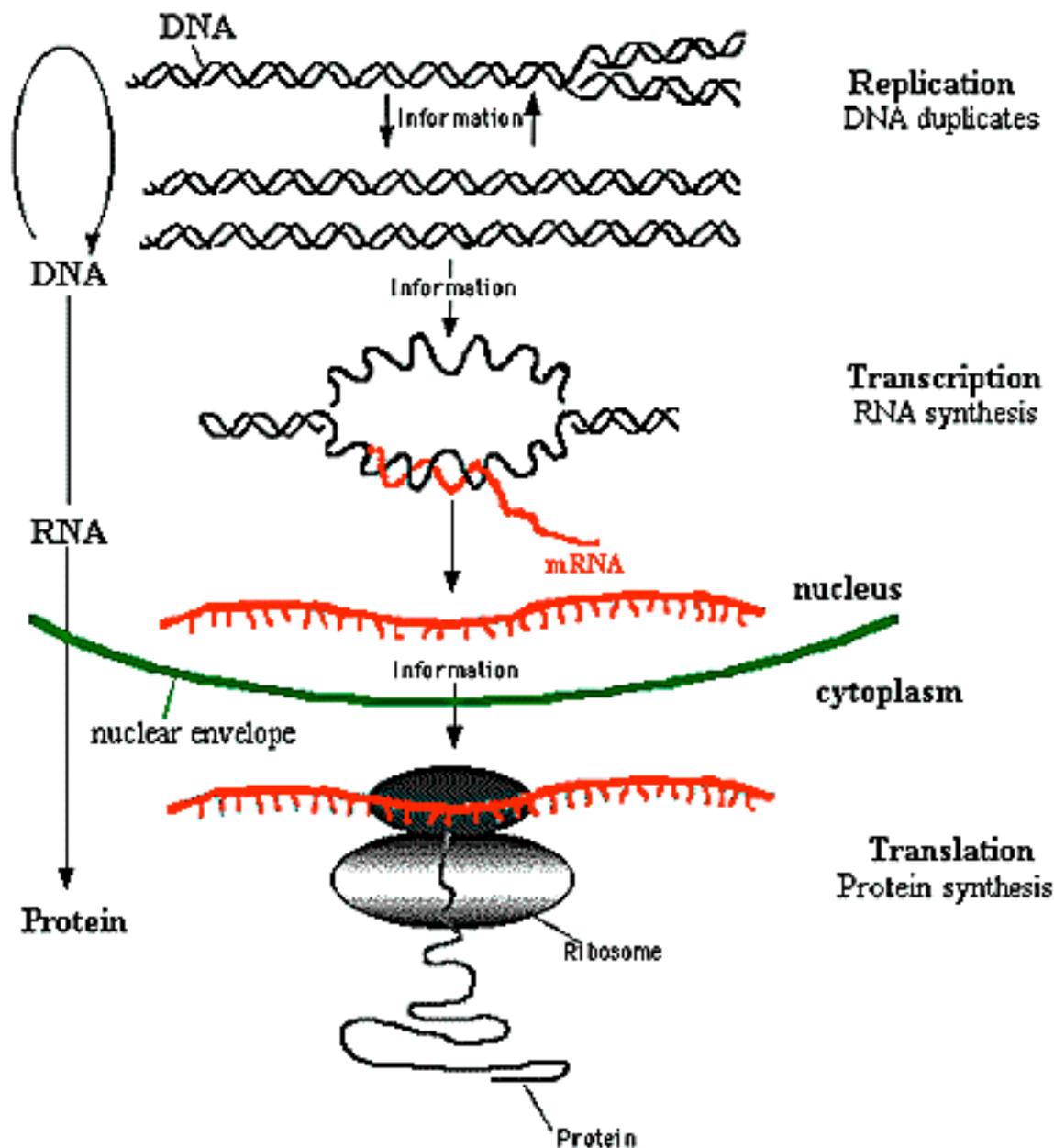
From  
Our  
World  
to  
Others

Michael Meyer  
*Astrobiology Senior  
Scientist*









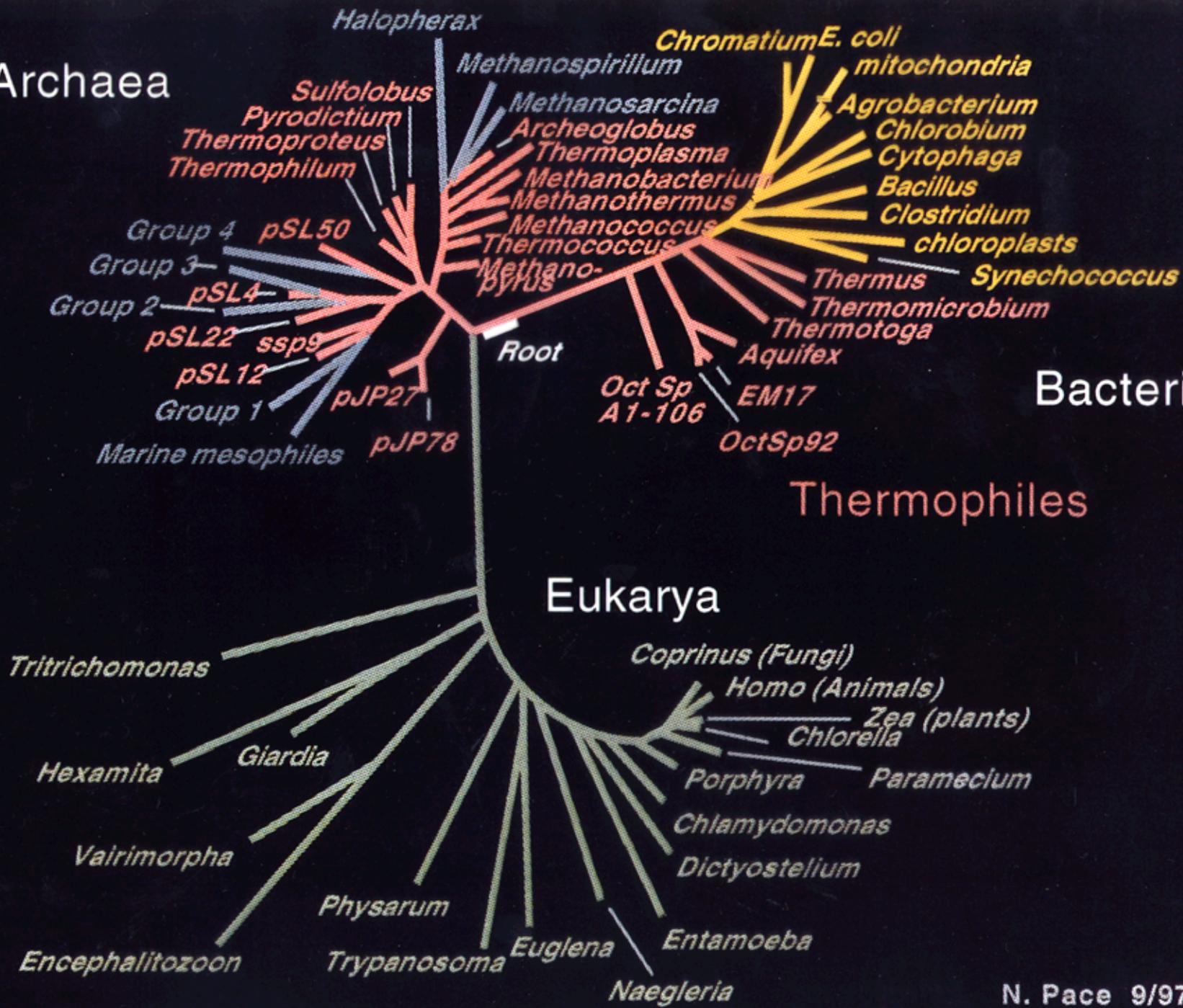
**The Central Dogma of Molecular Biology**

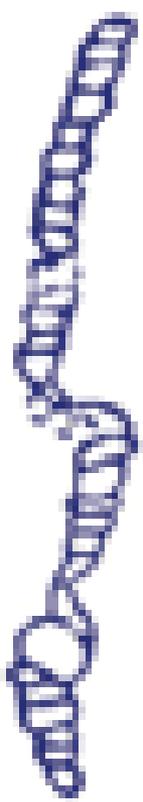
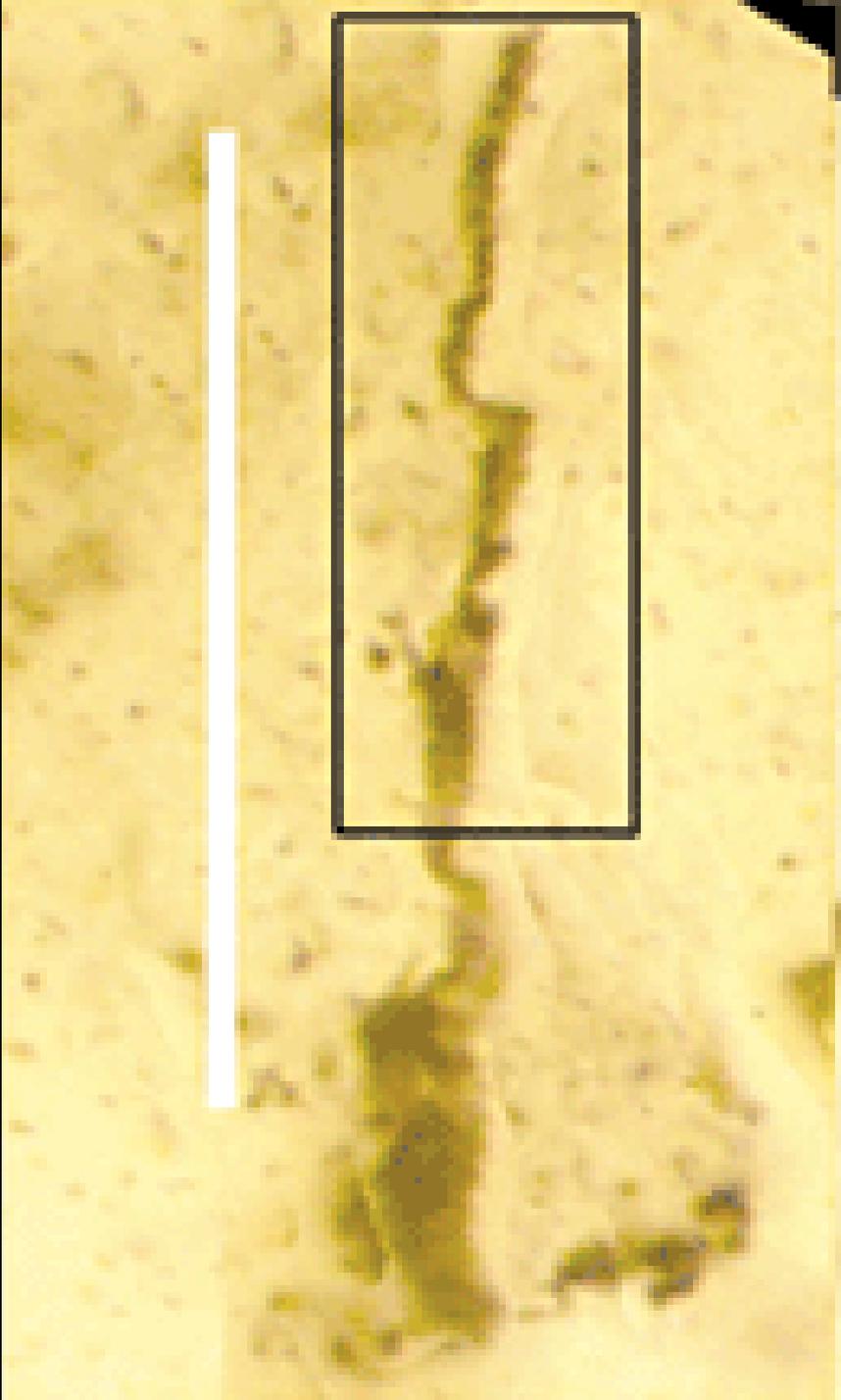
Archaea

Bacteria

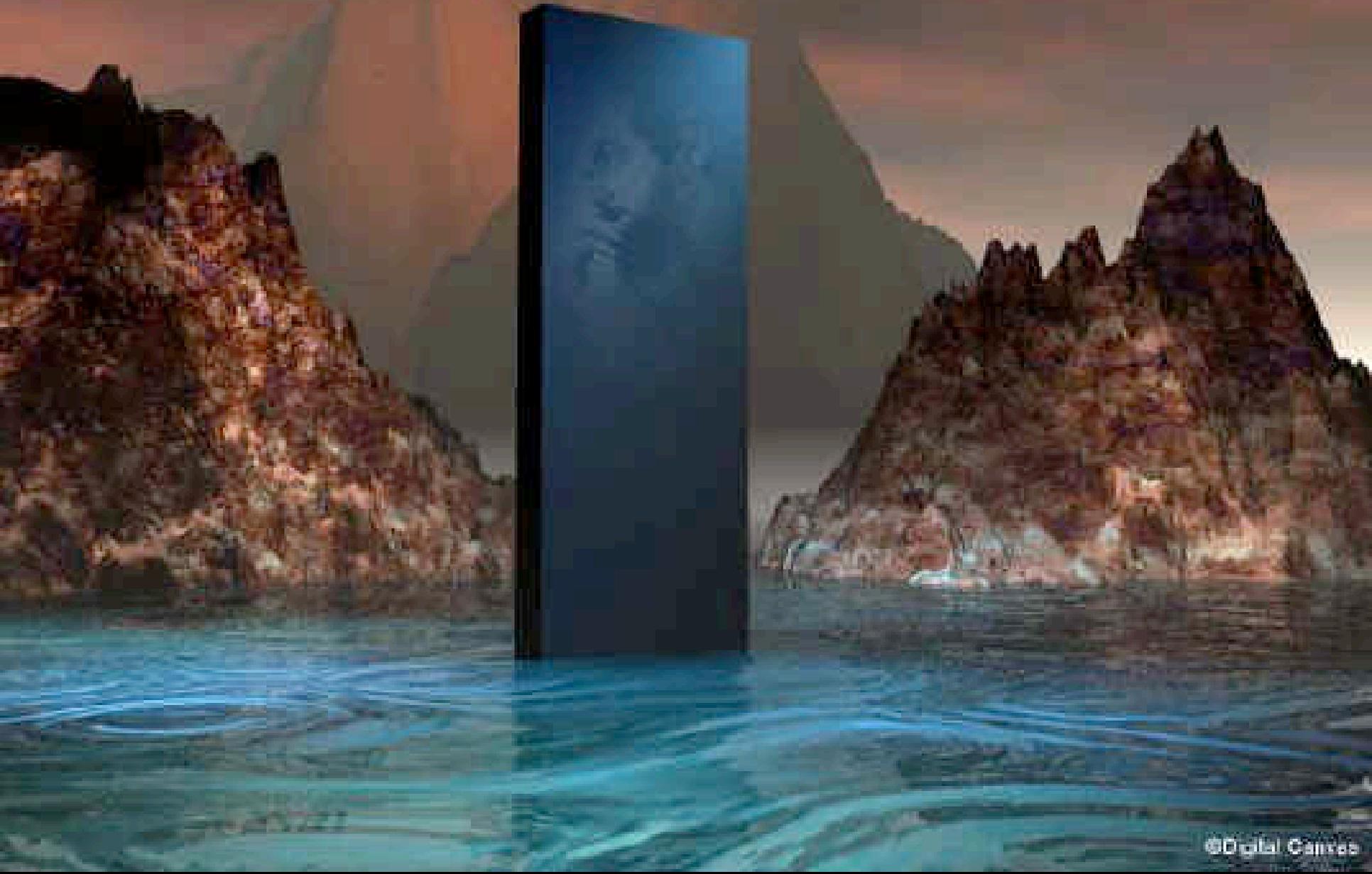
Thermophiles

Eukarya





Is there hope?



# Astrobiology

A grayscale microscopic image showing a cross-section of biological tissue, possibly a plant stem or root, with visible cellular structures and vascular bundles.

Astrobiology addresses three basic questions, which have been asked, in some form, for millennia

- ∅ How does life begin and evolve?
- ∅ Does life exist elsewhere in the universe?
- ∅ What is future of life on Earth and beyond?

# Astrobiology Elements

## Research and Analysis

- ∅ Exobiology & Evolutionary Biology Program : Research centered on pathways leading to and from the origin of life, and to understand the physical and biological forces that affect biological evolution and the interaction of life with its environment, ultimately to determine the potential and the search strategy for life elsewhere in the Universe

## NASA Astrobiology Institute

- ∅ Virtual institute whose members conduct interdisciplinary research as a community yet are geographically dispersed, interacting also with the national and international community

## Technology & Development Programs

- ∅ Astrobiology Science & Technology Instrument Development (ASTID): Life-centered perspective in technology development from concept to brass-board
- ∅ Astrobiology Science & Technology for Exploring Planets (ASTEP): Program of science-driven robotic campaigns to extreme environments to develop integrated system, exploration savvy, and astrobiology capabilities for space exploration

# On the horizon?

A grayscale microscopic image showing a cross-section of biological tissue. The image displays a complex network of cells and fibers, with some areas showing a more organized, grid-like structure, possibly representing a specific type of tissue or a developing organism.

- ∅ **“Weird” Life**
- ∅ **Mars Science Laboratory**
- ∅ **JIMO**
- ∅ **Moon - Mars**
- ∅ **Lake Vostok**
- ∅ **Neptune - underwater fiber optic system**



# Earth's Atmosphere Through Time

